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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of		Attorney Dkt:	TNL A-1403
Ulrich VOLLATH		Group Art Unit:	3662
Serial No.:	10/696,528	Examiner:	Fred H. MULL
Filed:	October 28, 2003		
For:	Ambiguity Estimation of GNSS Signals for Three or More Carriers		

DECLARATION UNDER 37 CFR §1.132

I, Nicholas Charles Talbot, declare and say:

That I am a citizen of Australia residing at 18 Amery Street, Ashburton, Victoria 3147, Australia.

That I was graduated in 1991 from RMIT University located in Melbourne, Australia, with a Doctor of Philosophy Degree in Applied Science. My Doctor of Philosophy Research was in Real-Time High Precision GPS Positioning Concepts: Modelling, Processing and Results. I also graduated in 1987 from RMIT University located in Melbourne, Australia, with a Bachelor of Applied Science Degree in Surveying.

That since 1991 I have been working in the field of Global Navigation System Signal (GNSS) processing. I have been employed since 1991 and am currently employed by Trimble Navigation Limited as a Senior Software Engineer, conducting research and development in the area of processing software and algorithms for high-precision GNSS products. I was Engineering Manager for development of the Trimble 7400MSi GPS receiver for earthmoving, construction and marine applications.

That from 1991-2000 I was a Lecturer in the Department of Land Information, RMIT University, teaching subjects including Geodesy, Scientific Communication, Satellite Positioning and Advanced Computations. I have supervised candidates for the degrees of Master of Applied Science and Doctor of Philosophy, in Applied Science.

That I have been granted more than ten United States Patents in the field of satellite-based positioning, surveying and machine guidance, and have published approximately thirty papers in the field of satellite positioning.

That I am familiar with the above-identified United States Patent Application Serial No. 10/696,528, published as United States Patent Publication No. 2005/0101248, and am aware that it is assigned to Trimble Navigation Limited.

That in connection with my duties as an employee of Trimble Navigation Limited, I was given a description of the invention as in the above-identified patent application and was tasked with implementing and testing the filters described therein, including the "Quintessence filters" described therein. Given the description of the filters contained in the patent application I was able to implement the filters for testing purposes and to successfully test the filters using simulated three-carrier GNSS data.

That in the above-identified patent application the structure and function of the "Quintessence filters" are specified, among other places in the following paragraphs of the published application:

> [0092] Quintessence filter bank includes respective geo-free and iono-free filter per satellite
> [0146]-[0161] Kalman filter formulation of geo-free filters used for the Quintessence filter banks
> [0162]-[0170] Filter initialization and update
> [0171] Implementation using the Bierman UD-Filter
> [0172]-[0176] Alternate formulation of Quintessence filter banks with "whitening of noise"
> [0182]-[0183] Quintessence filters use the Quintessence carrier phase combinations

[0195]-[0200] Properties of the Quintessence combinations
[0201]-[0203] Error Models for the combinations
[0220]-[0223] Quintessence carrier-phase combinations for nf carrier frequencies
[0239]-[0240] Quintessence carrier-phase combinations for three carrier frequencies
[0255]-[0257] Quintessence carrier-phase combinations for four carrier frequencies

That in my view, a person having a graduate degree in a discipline related to GNSS data processing, such as computer science, electrical engineering, surveying, mathematics, physics or the like, and having experience with GNSS data processing techniques, would have been capable of implementing the filters described in the above-identified patent application as of its filing date from the description given therein, including the "Quintessence filters" described therein. Such a person would be capable of understanding the formulas defining Kalman filters such as described A. Gelb (ed.), Applied Optimal Estimation, The M.I.T. Press, 1992. pp. 107-113, and of implementing Kalman filters as described for example in G. Bierman, Factorization Methods for Discrete Sequential Estimation, Academic Press, 1977 and/or other numerically-stabilized implementations of the Kalman filter algorithm, and would be capable of applying these techniques to implement the filters described in the above-identified patent application.

That despite being employed by the assignee of the above-identified patent application, the undersigned declares further that all statements made herein of his of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

Further declarant saith not.

April 22 2008

Signature: Nicholas Talbot

Nicholas Charles Talbot